

REMARKS

At the outset, Applicant acknowledges with appreciation the Examiner's courtesy in conducting the February 18, 2004 personal interview. During the interview, Applicant's representatives and Examiner Fortuna discussed the limitations of proposed amended independent claims 1 and 6 and the inherency issues raised in the October 30, 2003 Office Action. Applicant further acknowledges that an agreement as to the proposed claim limitations was not reached.

Claims 1 and 3-16 are pending in this application. Claims 1, 6 and 16 have been amended. No new matter has been introduced.

Claim 6 is rejected under 35 U.S.C. §112, second paragraph, as "failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention." (Office Action at 2). Specifically, the Examiner asserts that claim 6 is unclear "as to the Zeta potential of the membrane, as a property of the membrane." (Office Action at 2). Claim 6 has been amended to more clearly define the present structural attributes of the system. Applicant submits that all pending claims are now in full compliance with 35 U.S.C. §112.

Claim 6 is rejected under 35 U.S.C. §102(b) as being anticipated by Gan et al. (Beer Clarification by Cross-flow Microfiltration) ("Gan"). This rejection is respectfully traversed.

Amended independent claim 6 recites a "system for cross-flow microfiltration" comprising "an aqueous suspension of particles . . . having a sign of polarity and said aqueous suspension having a pH value" and "a porous ceramic filter having a membrane layer consisting of a least one metal-oxide." Amended independent claim 6 also recites that the membrane layer is "selected to have a Zeta potential with the same sign of polarity as the particles at the pH value of the aqueous suspension during filtration." Amended

independent claim 6 further recites “a pump for pumping the aqueous suspension through the porous ceramic filter.”

Gan does not anticipate the subject matter of amended independent claim 6. Gan does not disclose, teach or suggest “an aqueous suspension of particles . . . having a sign of polarity and said aqueous suspension having a pH value” and “a porous ceramic filter having a membrane layer consisting of a least one metal-oxide,” the membrane being “selected to have a Zeta potential with the same sign of polarity as the particles at the pH value of the aqueous suspension during filtration,” as amended independent claim 6 recites. Gan does not disclose the critical limitation that the Zeta potential of the filter membrane layer has *the same sign of polarity* as the particles in the suspension. Gan discloses a study of beer filtration fouling mechanisms and flux enhancement. Gan’s studies involve the effects of treating beer with enzymes, varying the pressure and creating flow pulsation, altering pore size, and using backflush. Gan does not disclose, teach or suggest that the Zeta potential of the filter membrane has the same sign of polarity as the particles.

Applicant submits that the assertion in the last Office Action that the charge of Zeta potential “seems to be inherent of the membrane material” (Office Action at 2) is an unsupported assertion. “When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference The mere fact that a certain thing may result from a given set of circumstances is not sufficient [to establish inherency] ‘That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.’” In re Rijckaert, 9 F.3d 1531, 1534 (Fed. Cir. 1993) (emphasis added). The Office Action fails to support its assumption with a reference to cited prior art. Moreover, a filter membrane does not inherently have the same sign of polarity as the particles to be retained. The Zeta potential of the membrane material depends on the pH value of the solution. There is no factual basis for the Examiner’s conclusion that the Zeta potential of the membrane material disclosed in Gan has the same sign of polarity as the particles to be retained, as

claimed by the Applicant. For at least these reasons, Gan fails to anticipate all limitations of amended independent claim 6, and withdrawal of the rejection of this claim is respectfully requested.

Claim 6 is rejected under 35 U.S.C. §102(b) as being anticipated by GB 2176715A (the “GB ’715 application”). This rejection is respectfully traversed.

Applicant submits that the GB ’715 application does not disclose, teach or suggest all limitations of amended independent claim 6. The GB ’715 application fails to disclose a Zeta potential, much less a Zeta potential or polarity either for the membrane filter or the particles to be retained. Accordingly, there is no factual basis for the Examiner’s conclusion that the GB ’715 patent application discloses a membrane filter having a Zeta potential with *the same sign of polarity* as the particles to be retained, and withdrawal of the rejection of claim 6 is also respectfully requested.

Claims 1 and 3-16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Burrell et al. (Crossflow Microfiltration of Beer; Laboratory-Scale Studies on the Effect of Pore Size) in view of Goldsmith et al. (U.S. Patent No. 5,114,581) and Ledoux (U.S. Patent No. 879,557)¹. Applicant respectfully traverses this rejection.

Amended independent claim 1 recites a “[m]ethod for the removal of particulate matter from aqueous suspension” by *inter alia* “measuring a value of pH of the suspension and determining a polarity of Zeta potential of particles in the suspension at the measured pH value,” “selecting a porous ceramic filter having a membrane layer consisting of at least a metal-oxide with a Zeta potential at the pH value of the suspension having same polarity of the Zeta potential as the particles in the suspension” and “passing the suspension through the porous filter.”

¹ Applicant is unclear as to what “Strohm et al (5,8789,557)” refers to on page 3 of the October 30, 2003 Office Action. Applicant assumes that “Strohm et al (5,8789,557)” is actually “Ledoux (U.S. Patent No. 879,557)” and thus, for the purposes of addressing this rejection, will treat “Strohm et al (5,8789,557)” as “Ledoux (U.S. Patent No. 879,557).”

The subject matter of claims 1 and 3-16 would not have been obvious over Burrel in view of Goldsmith and Ledoux. Specifically, the Office Action fails to establish a *prima facie* case of obviousness. Courts have generally recognized that a showing of a *prima facie* case of obviousness necessitates three requirements: (i) some suggestion or motivation, either in the references themselves or in the knowledge of a person of ordinary skill in the art, to modify the reference or combine the reference teachings; (ii) a reasonable expectation of success; and (iii) the prior art references must teach or suggest all claim limitations. See e.g., In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999); In re Rouffet, 149 F.3d 1350, 1355 (Fed. Cir. 1998); Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573 (Fed. Cir. 1996).

None of Burrel, Goldsmith or Ledoux, whether considered alone or in combination, teaches or suggests all limitations of amended independent claims 1 and 6. Burrel relates to studies concerning the effect of pore size on ceramic cross-filtration. For this, Burrel teaches conducting studies on various sizes of ceramic cross-flow filter membranes manufactured by Ceramem Corp. Accordingly, Burrel does not disclose, teach or suggest “measuring a value of pH of the suspension and determining a polarity of Zeta potential of particles in the suspension at the measured pH value” and “selecting a porous ceramic filter having a membrane layer consisting of at least a metal-oxide with a Zeta potential at the pH value of the suspension having same polarity of the Zeta potential as the particles in the suspension,” as amended independent claim 1 recites.

Burrel is also silent about a “system for cross-flow microfiltration” comprising “an aqueous suspension of particles to be retained, said particles having a sign of polarity and said aqueous suspension having a pH value” and “a porous ceramic filter having a membrane layer . . . selected to have a Zeta potential with the same sign of polarity as the particles at the pH value of the aqueous suspension during filtration,” as amended independent claim 6 recites. As noted above, the Zeta potential of the membrane is dependent on the pH value, and the membrane does not inherently have the same sign of polarity as the Zeta potential of the particles to be retained. There is no disclosure or

suggestion (inherent or otherwise) in Burrell that the filter membrane and particles have Zeta potentials with the same sign of polarity, as expressly recited in claims 1 and 6.

Similarly, Goldsmith and Ledoux fail to disclose all limitations of claims 1 and 3-6. Goldsmith discloses indeed that the membrane module is made of ceramic support and ceramic layer, which “inherently possesses the Z potential and properties claimed.” (Office Action at 4). However, as stated above, while a ceramic filter may possess a Zeta potential, it does not inherently have the same sign of polarity as the Zeta potential of the particles. Ledoux is also silent about a Zeta potential or a sign of polarity, much less about “an aqueous suspension of particles to be retained, said particles having a sign of polarity and said aqueous suspension having a pH value” and “a porous ceramic filter having a membrane layer . . . selected to have a Zeta potential with the same sign of polarity as the particles at the pH value of the aqueous suspension during filtration,” as amended independent claim 6 recites. For at least these reasons, the Office Action fails to establish a *prima facie* case of obviousness and withdrawal of the rejection of claims 1 and 3-16 is respectfully requested.

Claims 1, 3 and 7-16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Galaj et al (U.S. Patent No. 4,946,592) in view of Strom et al (U.S. Patent No. 4,946,592)².

Galaj does not disclose, teach or suggest all limitations of amended independent claim 1. Galaj is silent about a “[m]ethod for the removal of particulate matter from aqueous suspension” by *inter alia* “measuring a value of pH of the suspension and determining a polarity of Zeta potential of particles in the suspension at the measured pH value” and “selecting a porous ceramic filter having a membrane layer consisting of at least a metal-oxide with a Zeta potential at the pH value of the suspension having same polarity of the Zeta potential as the particles in the suspension.”

² Applicant is not clear as to what Strom et al (U.S. Patent No. 4,946,592) represents. Applicant affirms that Galaj et al is, in fact, U.S. Patent No. 4,946,592. Since Applicant does not know what the Examiner actually meant, Applicant treats this rejection as referring only to Galaj et al (U.S. Patent No. 4,946,592).

Although the Examiner concedes that “[t]he pH, and the membrane potential are not disclosed in reference ‘592’ (Office Action at 5), the Examiner asserts that one skilled in the art would have expected the same membrane performance as Applicant’s invention based on the membrane materials. However, Applicant’s invention includes the critical step of selecting a filter membrane with a Zeta potential having the same sign of polarity as the Zeta potential of the particles to be retained. This step is not disclosed, taught or suggested in Galaj. For at least these reasons, the Office Action fails again to establish a prima facie case of obviousness and withdrawal of the rejection of claims 1, 3 and 7-16 is respectfully requested.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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